



U.S. Department  
of Transportation  
Federal Highway  
Administration

# Memorandum

Subject: INFORMATION: Manual for Assessing  
Safety Hardware (MASH)

Date: November 20, 2009

From: David A. Nicol   
Director, Office of Safety Design

In Reply Refer To: HSSD

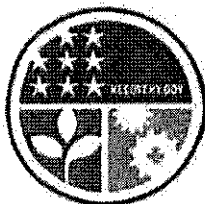
To: Directors of Field Services  
Federal Lands Highway Division Engineers  
Division Administrators

The American Association of State Highway and Transportation Officials (AASHTO) recently published the *Manual for Assessing Safety Hardware* (MASH). MASH is an update to and supersedes NCHRP Report 350, *Recommended Procedures for the Safety Performance Evaluation of Highway Features*, for the purposes of evaluating new safety hardware devices. MASH is not a design standard and does not supersede the criteria for the design of roadside safety hardware contained within the AASHTO Roadside Design Guide.

## Background

The purpose of MASH is to present uniform guidelines for the crash testing of both permanent and temporary highway safety features and evaluation criteria to assess test results. It also includes guidelines for the in-service evaluation of safety features. These guidelines and criteria, which have evolved over the past 40 years, incorporate current technology and the collective judgment and expertise of professionals in the field of roadside safety design. They provide: (1) a basis on which researchers and user agencies can compare the impact performance merits of candidate safety features, (2) guidance for developers of new safety features, and (3) a basis on which user agencies can formulate performance specifications for safety features.

The need for updated crash test criteria was based primarily on changes in the vehicle fleet. A summary of the differences between NCHRP Report 350 and MASH is attached for your information. The summary includes a brief synopsis of the expected effects on crash tested roadside hardware. A video presentation about this publication, developed by Mr. Dick Albin of the FHWA Resource Center, is online at:  
<https://admin.na3.acrobat.com/a55098539/mashfinal>



### **Implementation Plan**

Requirements in Section 1408 of SAFETEA-LU stated that "The Secretary, in cooperation with the Association [i.e., AASHTO], shall publish updated guidance regarding the conditions under which States, when choosing to improve or replace highway features on the NHS, should improve or replace such features...". The AASHTO/FHWA Implementation Plan was developed to satisfy that requirement.

Implementation of MASH on the NHS will be as follows:

- The AASHTO Technical Committee on Roadside Safety is responsible for developing and maintaining the evaluation criteria as adopted by AASHTO. FHWA shall continue its role in the review and acceptance of highway safety hardware.
- All highway safety hardware accepted prior to adoption of MASH using criteria contained in NCHRP Report 350 may remain in place and may continue to be manufactured and installed.
- Highway safety hardware accepted using NCHRP Report 350 criteria is not required to be retested using MASH criteria.
- If highway safety hardware that has been accepted by FHWA using criteria contained in NCHRP Report 350 fails testing using MASH criteria, AASHTO and FHWA will jointly review the test results and determine a course of action.
- Upon adoption of MASH by AASHTO, any new highway safety hardware not previously evaluated shall utilize MASH for evaluation and testing.
- Any new or revised highway safety hardware under development at the time the MASH is adopted may continue to be tested using the criteria in NCHRP Report 350. However, FHWA will not issue acceptance letters for new or revised highway safety hardware tested using NCHRP Report 350 criteria after January 1, 2011.
- Highway safety hardware installed on new construction and reconstruction projects shall be those accepted under NCHRP Report 350 or MASH.
- Agencies are encouraged to upgrade existing highway safety hardware that has not been accepted under NCHRP Report 350 or MASH:
  - during reconstruction projects,
  - during 3R projects, or
  - when the system is damaged beyond repair.
- Highway safety hardware not accepted under NCHRP Report 350 or MASH with no suitable alternatives available may remain in place and may continue to be installed.

### **Policy Implications**

As noted in the Implementation Plan, hardware that has been tested and accepted under NCHRP Report 350 does not have to be re-tested under MASH. States may leave that existing hardware in place and they may continue to install it in new projects. When Report 350 hardware fails crash testing under MASH criteria we will confer with AASHTO and determine whether the device may continue in use, decide to study it further, or recommend that other hardware be used.

We recommend that you advise your States NOT to immediately convert their specifications to require MASH-tested devices; there are not enough devices available that have been crash tested under the new guidelines. States should be open to allowing and/or adopting MASH-tested hardware as it becomes available, but most NHCPR Report 350 devices will continue to be acceptable for the near future.

#### **Availability of MASH**

The Office of Safety is purchasing one copy for each FHWA Division Office, including the Federal Lands Highway Division Offices, and these will be sent separately. MASH can be purchased from the AASHTO online bookstore:

[https://bookstore.transportation.org/item\\_details.aspx?ID=1539](https://bookstore.transportation.org/item_details.aspx?ID=1539). We also intend to purchase copies of the revised Roadside Design Guide for the Division Offices, the Resource Center, and FLHD, when it is issued in 2010.

#### **Attachment**

cc:

Associate Administrator for Infrastructure

Associate Administrator for Operations

Associate Administrator for Research, Development and Technology

Resource Center

SAFETYFIELD